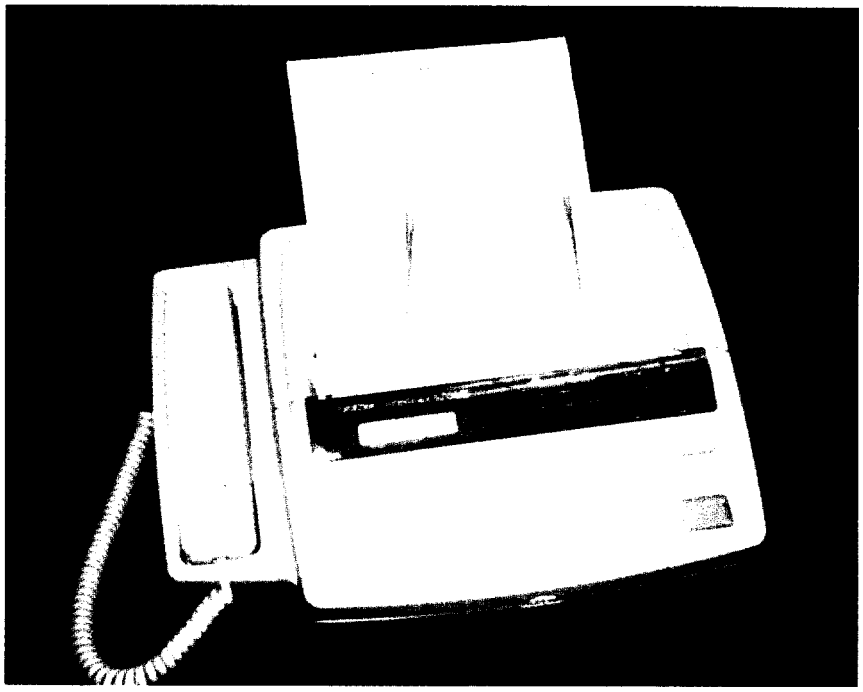
United States Department of Transportation
Federal Highway Administration
Federal Transit Administration

Technology in Rural Transportation "Simple Solution" #5

ENTERPRISE

Traveler Information Using Fax Machines



Introduction

This application was identified as a promising rural Intelligent Transportation Systems (ITS) solution under a project sponsored by the Federal Highway Administration (FHWA) and the ENTERPRISE program. This summary describes the solution as well as opportunities for expansion into the broader context of rural ITS.

Technology Overview

Increasingly detailed and up-to-the-minute information is becoming available concerning road and weather conditions. This simple solution provides a means of providing this information to a wide audience at a low cost. Presuming access to a regular fax machine, road and weather condition information, and other types of traveler information can be received from a central agency. Information can be faxed either on demand, according to a predefined schedule, or on a flexible basis to alert users of changing conditions. Information may be specific to the needs of the receiver or may be general in nature.

Real-world Example - **Colorado DOT Weather By Fax**

Overall goal: To provide cost-effective weather and road condition information to a wide range of users.

Technical approach: Current weather and road condition information and short-term forecasts are faxed to about 200 user agencies, including freight haulage companies, ports of entry, visitor centers, ski areas, and radio and television stations. The information is around two pages in length and is usually faxed out once a day in the summer months and four or five times a day during the winter. In addition to regular bulletins, supplementary faxes are sent to warn of unusual or particularly severe conditions, such as avalanches, the opening and closing of passes, or to advise travelers to put on or remove snow-chains. The information is collated using a variety of sources including Colorado DOT's 88 weather stations installed around the state, a NOAA terminal situated at the Traffic Operations Center, the Colorado State Patrol, and verbal reports from ports of entry personnel.

Current status: The information was previously sent out from the Traffic Operations Center itself, using a series of six fax machines using pre-programmed broadcast lists. Given the number of recipients and the frequency of faxes, especially in winter, this system was very labor-intensive. Recently, CDOT contracted with a consultant and telecommunications company to provide fax services. The information is faxed from a CDOT PC to the service provider, from where information is broadcast virtually simultaneously to all recipients. Users receive the information in between three and nine minutes from the time of receipt at the service provider depending on the number of "retries" that are necessary to connect with their fax machines.

Location / geographic scope: Agencies throughout the state of Colorado receive the information. In addition, agencies along the I-70 and I-80 corridors into Wyoming and Utah are also provided with the information.

Agencies involved: The system is operated by the Colorado Department of Transportation Traffic Operations Center. The fax services are provided by Expedite through the IdealDial service provider.

Cost information: IdealDial charged CDOT $250 for the set-up fee. However, the customary fee for setting up such a service depends on the number of fax recipients, and is usually around $1,000. As CDOT uses IdealDial for other services a discount was applicable. In addition to the set-up fee, a fee of 25¢ a minute for fax transmission is charged. CDOT estimates that this can be equated to 25¢ a page. The costs for transmission also vary by volume of transmissions and would decrease significantly for greater quantities of information.

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Have goals been achieved? The current system has been in operation since early December, 1996. So far, the system has proved to be a vast improvement over the previous method due to the increased speed with which information is transmitted to the users. Also, TOC staff time can be better utilized, now that CDOT personnel do not fax the information themselves. No staff positions have been lost as a result of the fax automation.

Solution timeline: CDOT plans to work with the telecommunications service provider to customize the system to better meet their needs. Additional features CDOT requires are as follows:

- More detailed transmission reports providing details of failed transmissions in a more timely manner so faxes can be sent to these recipients manually by CDOT.
- More flexibility to stop the fax run partway through if new information is received.
- Only one retry if a fax number cannot be reached at first in order to speed up the overall process.

Further Description of Application

Additional technologies may include: Other means of disseminating general traveler information, or specific road / weather condition information, on a low-cost basis using equipment that many users already have access to could include:

- Electronic mail (e-mail) could be used to disseminate information to anyone with access to an e-mail account. E-mail could also allow for transfer of data files, pictures, written text or audio.
- Voice messages could be recorded and sent out over commercial voice messaging systems.
- Voice messages could also be recorded on an agency's voice mail announcement allowing end users of the system to call up and listen to the announcement.
- Internet information services.

Potential additional uses for this technology may include:

- On-demand directions to and from specific locations.
- Traffic and road condition reports tailored to a specific route, either for a regular commute or for a less frequent trip, such as a vacation or traveling to relatives for holidays.

Benefits of Application

	Benefits to travelers / the community	Benefits to business / industry	Benefits to the public sector
Direct benefits	Travelers are better informed about conditions on the roadways before embarking on trips, without requesting information	Fleet operators are more informed about the road conditions and can plan dispatching accordingly	Agencies can provide services at a low-cost
Indirect benefits	Improved safety and efficiency on the roadways.	Greater client confidence in adherence to delivery schedules	Improved public perceptions of value provided by public agencies

Probable Implementation Process

Step One: Interested agencies must determine the extent of the area about which information will be disseminated, for example, a city, corridor, county, or state-wide. This will be determined by the amount and type of data concerning a particular area which can be easily collected and delivered to a central processing area.

Step Two: Agencies must decide what information will be disseminated using the service, being careful not to offer services which are impractical under existing budgets. It also may be appropriate to determine what information services are already being offered by other agencies, including private sector organizations.

Step Three: Agencies should determine whether they plan to charge users for the information provided, and whether this would be on a flat subscription fee basis or whether charges would vary according to the actual amount and frequency of information provided. Fee levels should be determined.

Step Four: Agencies should perform some research into the potential numbers of users interested in receiving information, given the area of coverage, the types of information available, and the fees for receiving information, if applicable. This will determine whether the agency disseminates information itself using the regular fax, voicemail, or e-mail broadcast capabilities offered by off-the-shelf machines (practicable only for

smaller numbers of users), or whether the agency contracts with a telecommunications provider to disseminate the information.

Step Five: Appropriate information formats and message descriptions should be developed. Ultimately, all end users should receive a description of message definitions, for example, reduced speed means slower than normal traffic flow.

Step Six: Agencies should advertise the service and begin signing up interested office buildings, companies, and individuals, noting whether those requesting the service have access to fax machines, e-mail accounts, voice mail, or direct telephone numbers.

Step Seven: Delivery of traveler information can begin, following a standard procedure for disseminating the information bulletins at regular times to all subscribing users.

Potential Implementation Issues When considering implementing the system, agencies should consider the cost implications of future demand by additional users. Although economies of scale should result, if significantly more users wish to subscribe to the service, the costs of providing the service may become too great for the agency if fees were not levied from the outset.

Solution's Contribution to Broader Rural ITS Developments This solution is an example of a region-wide dissemination system that, when used in conjunction with other data collection and information processing systems, will contribute to the following rural intelligent transportation systems:

Roadway Management - This solution can be a critical factor in the dissemination of information to contribute to the overall management of rural roadway events. Such events may include: road closures, significant delays or hazardous weather conditions.

Regional Traveler Information - This solution can serve as part of a regional information system, disseminating general information or alerting motorists of real-time events.

Incident Management - When coupled with incident notification and verification, this solution can contribute to management of incidents.

The Technology in Rural Transportation: "Simple Solutions" Project

This project was performed within the ENTERPRISE pooled-fund study program, and aimed to identify and describe proven, cost-effective, "low-tech" solutions for rural transportation-related problems or needs. "Simple solutions" studied within the project focussed on practical applications of technologies, which could serve as precursors to future applications of more advanced systems, or intelligent transportation systems (ITS).

More than fifty solutions were initially identified and documented. Of these, fourteen solutions were documented and analyzed in detail. The transportation technology applications were also categorized according to the seven Critical Program Areas (CPAs) defined within the U.S. Department of Transportation's Advanced Rural Transportation Systems Program. It is hoped to utilize the information gathered within this study to perform outreach to local level transportation professionals to introduce them to ITS and its potential benefits.

For More Information: A full report on this study is available from the FHWA R&T Report Center, telephone no. 301-577-0818. **Title:** Technology in Rural Transportation: "Simple Solutions." **Publication No.:** FHWA- RD-97-108. This research was conducted by Castle Rock Consultants, Eagan, Minnesota. For more information, contact Paul Pisano of FHWA, HSR-30, 703-285-2498. For more information about ENTERPRISE, contact Bill Legg, Washington State DOT, 206-543-3332.

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